



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) Publication number:

0 310 867 A3

(12)

EUROPEAN PATENT APPLICATION

(21) Application number: **88115504.8**

(51) Int. Cl.⁵: **G01N 30/60, B01D 15/08**

(22) Date of filing: **21.09.88**

(30) Priority: **05.10.87 JP 251323/87**

(43) Date of publication of application:
12.04.89 Bulletin 89/15

(84) Designated Contracting States:
DE FR GB

(88) Date of deferred publication of the search report:
31.07.91 Bulletin 91/31

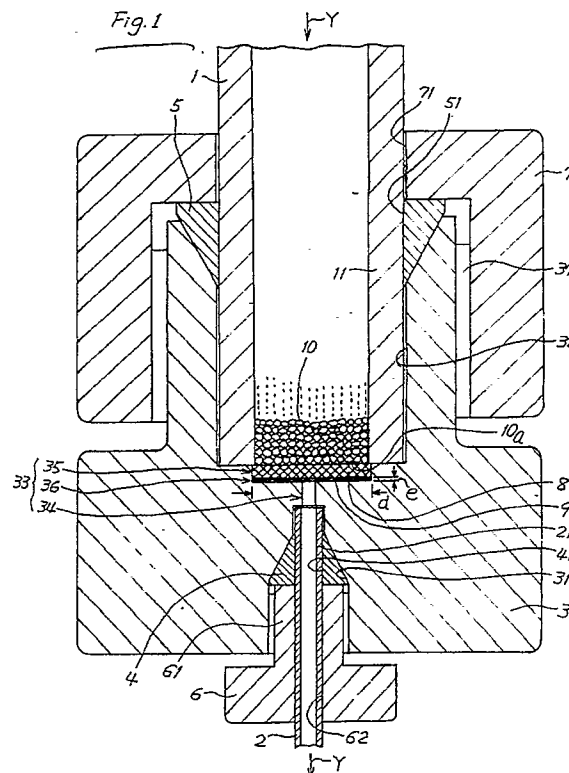
(71) Applicant: **SHIMADZU TECHNO-RESEARCH
INC.**
9, Nishinokyo Shimoaicho
Nakagyo-ku Kyoto(JP)

(72) Inventor: **Haruki, Tatsuro**
1-31, Megamiyama-cho Koyoen
Nishinomiya Hyogo(JP)

(74) Representative: **Tiedtke, Harro, Dipl.-Ing. et al**
Patentanwaltsbüro Tiedtke-Bühling-Kinne-
Grube-Pellmann-Grams-Struif-Winter-Roth
Bavariaring 4
W-8000 München 2(DE)

(54) **Chromatographic column.**

(57) A chromatographic column provided with a spacer (9) in contact with the upstream end surface of an inlet filter (8) holding the upstream end of the stationary phase filling (10) the column pipe (1), and/or the downstream end surface of an outlet filter holding the downstream end of the stationary phase, the spacer providing a flow path having a flow resistance value sufficiently smaller than that of the filters, so that the flow path of the spacer can disperse a mobile phase supplied to the column substantially instantly all over the inlet filter surface, or collect the mobile phase substantially instantly from all over the outlet filter surface into a mobile phase discharging tube, thereby to prevent the sample flowing through the filters from being unduly broadened in the direction of flow, and to obtain a chromatogram with sharper and more symmetrical peaks than otherwise.



EP 0 310 867 A3



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
P,X	EP-A-0176891 (MERCK PATENT GMBH) * claims 1-7; figures 1-6 *	1	G01N30/60 B01D15/08
X	DE-A-3424787 (CIBA-GEIGY AG) * page 8, lines 1-15; claims 1,13 *	1	
A	DE-U-8523697 (MACHEREY, NAGEL & CO.) * page 4, lines 13-24 *	1	
A	GB-A-1236094 (ABCOR INC.) * figure 3; page 2, line 124 - page 3, line 130 *	1,6-10	
A	GB-A- 2110951 (WATER ASSOCIATES INC.) * abstract; figure 8 *	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
			G01N B01D
The present search report has been drawn up for claims 1-10			
Place of search Berlin		Date of completion of the search 09.11.1990	Examiner O.P. BRISON
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	



CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ All claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claims:
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

x

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions, namely:

- | | |
|----------------------------|---|
| 1. claims: 1-10 | Means for supporting filter of chromatograph column |
| 2. claims: 11-13,
17-20 | Filter for chromatographic column |
| 3. claims: 14-16 | Spacer for use in a chromatographic column |

- ☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☒ None of the further search fees has been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims,

namely claims: 1-10